

REMARKS

Initially, Applicant expresses appreciation to the Examiner for the detailed Official Action provided.

Upon entry of the present paper, claims 1 and 12 will have been amended, and claims 22-24 will have been cancelled without prejudice or disclaimer of the subject matter thereof. The herein-contained amendments should not be considered an indication of Applicant's acquiescence as to the propriety of the outstanding rejection. Rather, Applicant has amended claims 1 and 12 in order to advance prosecution and obtain early allowance of the claims in the present application. Furthermore, no new matter has been introduced by the abovementioned amendments. Thus, claims 1-2, 4-13, and 15-21 are currently pending in the application with claims 10-11 and 21 being withdrawn from consideration in a previous Official Action.

Applicant addresses the rejections provided within the Official Action below and respectfully requests reconsideration and withdrawal of the outstanding rejections of the claims pending in the present application together with an indication of the allowability of claims 1-2, 4-9, 12-13, and 15-20 (i.e., all pending non-withdrawn claims) in the next Official communication. Such action is respectfully requested and is now believed to be appropriate for at least the reasons provided below.

The Rejection under 35 U.S.C. § 112

In the outstanding Official Action, the Examiner has maintained the rejection of claim 16 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as

the invention. Specifically, with respect to the recitation in claim 16 of “when said optical switch connects the outgoing side of said first back-end optical amplifier and the incident side of said second front-end optical amplifier to each other,” the Examiner asserts, on page 2 of the outstanding Official Action, that “it is unclear whether light incident from the pump or signal light incident from the previous amplifiers is meant.

Applicant respectfully traverses the Examiner’s rejection of claim 16 under 35 U.S.C. § 112. In this regard, Applicant notes that, independent claim 12 (the claim from which claim 16 depends) recites “a second front-end pumping light coupler that introduces the second pumping light supplied to said second front-end optical fiber amplifier from an outgoing side which is opposite to an incident side.” In other words, the claims clearly recite the second front-end pumping light coupler as having an outgoing side and an incident side (which are opposite to one another). Furthermore, the claims recite the outgoing side as receiving light incident from the pump. Accordingly, one skilled in the art would readily understand that the incident side does not receive light incident from the pump but rather receives signal light incident from the previous amplifiers.

Accordingly, it is thus respectfully requested that the Examiner withdraw the rejection of claim 16 under 35 U.S.C. § 112, second paragraph.

The Rejection under 35 U.S.C. § 103

The Examiner rejected claims 1, 2, 4-9, 12-13, 15-20, and 22-24 (i.e., all pending claims) under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 6,535,331 to SHIOTA et al. in view of U.S. Pat. No. 5,115,338 to DIGIOVANNI et al. and further in view of U.S. Pat. No. 6,553,180 to LIU et al.

Initially, Applicant notes that, without agreeing to the propriety of the Examiner's rejection and solely to expedite the patent examination process, Applicant has amended claims 1 and 12 (i.e., all independent claims pending in the present application) to enhance clarity.

In this regard, Applicant respectfully traverses the Examiner's rejection under 35 U.S.C. § 103(a). Specifically, with respect to currently amended independent claim 1, Applicant respectfully submits that SHIOTA, DIGIOVANNI, and LIU, whether considered alone or in any proper combination thereof, fail to disclose or render obvious an optical amplifier apparatus including at least: a first front-end pumping light introducing section disposed between a first front-end optical amplifier and a first back-end optical amplifier; and a second front-end pumping light introducing section disposed between a second front-end optical fiber amplifier and a second back-end optical fiber amplifier.

To the contrary, SHIOTA discloses a single-stage optical amplifier for amplifying an input optical signal of a known wavelength in one of at least two bands of wavelength. The single-stage optical amplifier, as disclosed by SHIOTA, includes a C-band optical amplifier 120 and an L-band optical amplifier 220 interconnected by an optical switch 50. The C-band optical amplifier 120 includes a first optical amplifier 21 and the L-band optical amplifier 220 includes a second optical amplifier 22. However, as acknowledged by the Examiner on page 3 of the previous Official Action of December 27, 2007, SHIOTA does not disclose the C-band optical amplifier 120 including both a first front-end optical amplifier and a first back-end optical amplifier. Similarly, SHIOTA does not

disclose the L-band optical amplifier including both a second front-end optical amplifier and a second back-end optical amplifier.

In this regard, the Examiner relies on DIGIOVANNI to teach an optical fiber amplifier with two gain stages. The Examiner interprets DIGIOVANNI as disclosing fiber 18 as being a front-end optical amplifier and fiber 19 as being a back-end optical amplifier. The Examiner further interprets DIGIOVANNI, as indicated on page 3 of the outstanding Official Action, as disclosing a front-end light source 38 which introduces pump light into the front-end optical amplifier 18 and a back-end pump light source 34 which introduces pump light into the back-end optical amplifier 19. Furthermore, the Examiner asserts that it would be obvious to one of ordinary skill in the art to replace the single stage optical amplifiers 21 and 22 of SHIOTA with the fibers 18 and 19 as shown in Figure 1 of DIGIOVANNI.

Even assuming, *arguendo*, that the single stage optical amplifiers 21 and 22 of SHIOTA were replaceable with the fibers 18 and 19 of DIGIOVANNI in the manner suggested by the Examiner, one would still not arrive at the combination of features recited in currently amended claim 1. That is, the pump light source 38 of DIGIOVANNI would be forward pumping the front-end fiber 18. In contradistinction, claim 1 recites the first front-end pumping light introducing section is disposed between the first front-end optical amplifier and the first back-end optical amplifier; and the second front-end pumping light introducing section is disposed between the second front-end optical fiber amplifier and the second back-end optical fiber amplifier. In this regard, the first front-end optical fiber amplifier and the second front-end optical fiber amplifier are pumped backward (i.e., receive pumping light on the outgoing side) by the first

pumping light source and the second pumping light source respectively. Thus, even assuming, *arguendo*, that SHIOTA and DIGIOVANNI are combinable in the manner suggested by the Examiner, one would still not arrive at the combination of features recited in currently amended independent claim 1.

With respect to LIU, Applicant submits that LIU fails to disclose or suggest that which is lacking in SHIOTA and DIGIOVANNI. In this regard, the Official Action relies on LIU only to teach an optical fiber amplifier that operates in the L-band with two gain stages. Therefore, LIU fails to remedy the deficiencies of SHIOTA and DIGIOVANNI as discussed above. Specifically, LIU does not teach or render obvious the first front-end pumping light introducing section disposed between the first front-end optical amplifier and the first back-end optical amplifier, and the second front-end pumping light introducing section disposed between the second front-end optical fiber amplifier and the second back-end optical fiber amplifier. Accordingly, the combination of SHIOTA, DIGIOVANNI, and LIU fails to disclose or render obvious all of the elements of amended claim 1.

For at least these reasons, Applicant respectfully submits that the combination of SHIOTA, DIGIOVANNI, and LIU do not anticipate or render obvious the invention recited in currently amended independent claim 1, and respectfully request withdrawal of the 35 U.S.C. § 103 rejection.

With respect to independent claim 12, Applicant respectfully submits that, for at least the reasons discussed *supra*, the applied references similarly fail to disclose or render obvious an optical amplifier apparatus including at least: a first front-end pumping light coupler disposed between a first front-end optical amplifier and a first back-end

optical amplifier; and a second front-end pumping light coupler disposed between a second front-end optical fiber amplifier and a second back-end optical fiber amplifier. Thus, Applicant submits that independent claim 12 is also allowable for at least the reasons discussed *supra*.

With respect to the Examiner's rejection of dependent claims 2, 4-9, 13, and 15-20, Applicant submits that these claims are all directly or indirectly dependent from one of allowable independent claims 1 and 12, which are allowable for at least the reasons discussed *supra*. Thus, these dependent claims are also allowable for at least the reasons discussed *supra*. Furthermore, all dependent claims recite additional features which further define the present invention over the references of record.

Thus, Applicant respectfully submits that each and every pending claim of the present application meets the requirements for Patentability at least under 35 U.S.C. § 103, and respectfully requests the Examiner to indicate the allowance of each and every pending claim in the present application.

CONCLUSION

In view of the fact that none of the art of record, whether considered alone, or in any proper combination thereof, discloses or renders obvious the present invention as now defined by the pending claims, and in further view of the above amendments and remarks, reconsideration of the Examiner's action and allowance of the present application are respectfully requested and are believed to be appropriate.

Applicant notes that this amendment is being made to advance prosecution of the application to allowance, and should not be considered as surrendering equivalents of the territory between the claims prior to the present amendment and the amended claims. Further, no acquiescence as to the propriety of the Examiner's rejection is made by the present amendment. All other amendments to the claims which have been made in this amendment, and which have not been specifically noted to overcome a rejection based upon the prior art, should be considered to have been made for a purpose unrelated to patentability, and no estoppel should be deemed to attach thereto.

Should the Commissioner determine that an extension of time is required in order to render this response timely and/or complete, a formal request for an extension of time, under 37 C.F.R. §1.136(a), is herewith made in an amount equal to the time period required to render this response timely and/or complete. The Commissioner is authorized to charge any required extension of time fee under 37 C.F.R. §1.17 to Deposit Account No. 19-0089.

If there should be any questions concerning this application, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,
Atsushi SEKI

 William Pieprz
Reg. No. 33630

Bruce H. Bernstein
Reg. No. 29,027

December 01, 2008
GREENBLUM & BERNSTEIN, P.L.C.
1950 Roland Clarke Place
Reston, VA 20191
(703) 716-1191